Request for Economic Stimulus Funds

Concept Proposal

Submitters (Name of Workgroup & Chair/Co-Chairs):

Name of Workgroup: Commercial Remote Sensing and Geospatial Technology Group

Workgroup Chair and PI: Dr. Haluk Cetin, Murray State University

Co-PI: Dr. Tom Mueller, University of Kentucky

Project Title:

Establishment of a Commercial Remote Sensing and Geospatial Technology Consortium for Resource Management in Kentucky

Project Partners (Known or Anticipated):

Department of Geosciences, Murray State University

Department of Agricultural Sciences, Murray State University

Department of Biological Sciences, Murray State University

Soil and Water Conservation and Management, University of Kentucky

CVIP Laboratory, University of Louisville

Division of Geographic Information, Commonwealth Office of Technology

Pennyrile Area Development District, Hopkinsville

Purchase Area Development District, Mayfield

Institute for Regional Analysis and Public Policy, Morehead State University

Department of Geography and Geology, Western Kentucky University

National Geospatial Technology Center, Kentucky Community and Technical College System

NASA Collaborators:

Jet Propulsion Laboratory, Pasadena, California

Stennis Space Center, Mississippi

Industry Collaborators:

ITD Spectral Visions, Stennis Space Center, NASA, Mississippi

Plangraphics, Frankford, Kentucky

ResMar, Murray, Kentucky

Ag Connections Inc., Murray, Kentucky

Project Background & Purpose (Justification for Project):

The main objective of this project is to establish a Kentucky research consortium focusing on commercialization of remote sensing and geospatial technology, such as Geographic Information Systems (GIS), for resource management. NASA's Earth Science Enterprise (ESE) is a national science program striving to develop understanding of the total Earth system and the effects of natural and human-induced changes on the global environment. ESE has developed a commercial strategy including active industry and academic involvement, with the goal "to support the development and leverage commercial capabilities in remote sensing and information systems in order to cost-effectively meet ESE science objectives and enhance the relevance of scientific discovery." NASA and other agencies have been developing new broad-area remote sensors, which provide global high spectral/spatial resolution data. NASA has already established a commercial remote sensing program (ARC Program, Commercial Remote Sensing Program Office, Stennis Space Center, NASA). There is no commercial remote sensing research program in Kentucky. Establishment of such center should help Kentucky companies be more competitive in the field of resource management, and help educate/train students and researchers in geospatial technologies.

Project Description (General Goals & Implementation Strategies):

Our main goal is to establish a research group using remote sensing and GIS for earth science, forestry, agricultural and commercial applications, and to conduct fundamental research in remote sensing, which may also stimulate opportunities for new industry-wide applications.. Dr. Cetin has collaborated with the Stennis Space Center to establish a commercial remote sensing program focusing on precision agriculture in Kentucky. The Commercial Remote Sensing and Geospatial Technology work group plans to develop new algorithms using high spectral resolution data sets/images obtained by state-of-the-art remote sensors of NASA in order to monitor water resources (water quality and flood mapping), agricultural and forested areas, to detect stressed vegetation, as well as to map/identify individual vegetation species that should have direct applications to be used by commercial forestry and agricultural companies. This project will contribute to determination of the relationship between remotely sensed imagery and status of crops, to detection of forest ecosystem changes in terms of environmental change, and to development of models of diverse vegetation communities and their responses to regional environmental change. Several outreach programs and workshops will be conducted to educate High school and undergraduate/graduate students as well as researchers of state and private institutions. Most workshops and outreach programs will focus on commercial applications of remote sensing and GIS. We plan to work on techniques to transfer NASA's technology to commercial applications with companies such as ITD, ResMar and Ag Connections. Our ultimate goal is to establish a "Commercial Remote Sensing and Geospatial Technology Center" in Kentucky to create new job opportunities, to transfer NASA technology, and to educate students and the public for the 21st century workforce.

Project Team (Project Manager(s), Content Experts, Instructional Designers, etc.):

Project Manager: Dr. Haluk Cetin, Director, Hyperspectral Laboratory, Murray State University

Dr. Tom Mueller, University of Kentucky (Soil and Water Conservation and Management)

Dr. Iin Handayani, Murray State University (Agriculture)

Dr. David Ferguson, Murray State University (Agriculture)

Dr. Robin Zhang, Murray State University (Remote sensing/GIS)

Dr. Kate He, Murray State University (Biology/Forestry)

Dr. Timothy S. Stombaugh, University of Kentucky (Agricultural Engineering)

Dr. Aly A. Farag, Director, CVIP Laboratory, University of Louisville (Remote sensing)

Dr. Demetrio Zourarakis, Geospatial Analyst for the Commonwealth of Kentucky, (Remote sensing/GIS)

Pennyrile and Purchase Area Development Districts (GIS)

Dr. Christine McMichael, Institute for Regional Analysis and Public Policy, Morehead State University (Remote sensing)

Department of Geography and Geology, Western Kentucky University (GIS)

National Geospatial Technology Center, Kentucky Community and Technical College System (GIS)

Dr. Robert O. Green, Jet Propulsion Laboratory, NASA (Remote sensing)

Stennis Space Center, Mississippi (Commercialization)

ITD Spectral Visions, Stennis Space Center, NASA, Mississippi (Remote sensing/ Commercialization)

Plangraphics, Frankford, Kentucky (Remote sensing/GIS)

ResMar, Murray, Kentucky (Remote sensing/GIS)

Ag Connections Inc., Murray, Kentucky (Remote sensing/GIS)

Project Budget & Amount of Economic Stimulus Funds Requested:

Three year budget:

Salary and benefits	$150,000
Subcontracts ($150,000 x 5 institutions)	$750,000
Technology transfer support service personnel	$120,000
Travel support (($21,000 x 6 institutions)	$126,000
Outreach program and workshop expenses	$90,000
Equipment	$373,000
Materials/Supplies	$50,000

Remotely sensed data collection/purchase	$300,000
Estimated total funds requested for three years	**$1,976,000**